

What is claimed is:

Sub 1
1. A tire building apparatus comprising a group of many segments enlarging a size in a radial direction to pushingly lock a bead portion of a green tire, a ring-shaped inner piston engaging with the segments of such a group and moving inward in a direction of an axial line to enlarge the size of each of the segments, a ring-shaped outer piston contacting and engaging with a back face of the inner piston to move the inner piston inward in the direction of the axial line, a cylinder slidably housing the inner piston and the outer piston in its double wall, a pair of gas pressure acting means moving each of the inner piston and outer piston housed in the double wall inward or outward in the direction of the axial line, and a stopper formed in the cylinder for stopping the inward movement of the outer piston at a given position before the completion of the inward movement of the inner piston.

2. A tire building apparatus according to claim 1, wherein the inner piston has a slant face taperingly extending toward its inner top end and contacting and engaging with each of the segments, and the slant face has a mechanism that the size of the segment is enlarged in the radial direction accompanied with the inward movement of the inner piston.

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3. A tire building apparatus according to claim 1, wherein the group of the segments has a tensile elastic means stretching in the radial direction in the enlargement of the size of the segment and is provided on inner end portion in the radial direction with a wheel rotatably contacting with the slant face of the inner piston.

4. A tire building apparatus according to claim 1, wherein the inner piston has a first-stage moving stroke corresponding to a moving stroke of the outer piston and a second-stage moving stroke further moving over the moving stroke of the outer piston to conduct the size enlarging operation of each of the segments at two stages.

Sub 3-5. A tire building apparatus according to claim 1, wherein the group of the segments has a push-locking face at a first size-enlarging stage having a clearance of 0.5-1.0 mm to an inner face of the bead portion of the green tire and a push-locking face at a second size-enlarging stage pushingly locking the bead portion of the green tire.

6. A tire building apparatus according to claim 1, wherein the gas pressure acting means is provided with a pressurized gas supplying device for supplying two kinds of high-pressure and low-pressure gases, and the pressurized gas supplying device has means for supplying a low-pressure gas to a back face of the outer piston and means for supplying a high-pressure gas to a back face of the inner piston and a back face of the outer piston, respectively.

7. A tire building apparatus according to claim 6, wherein the cylinder has a gas path communicating to an exterior at a back face side of the inner piston in a waiting position thereof and a gas space located at the back face side of the outer piston in the waiting position, and means for supplying a high-pressure gas is connected to the gas path and a pressurized gas supplying device for supplying two kinds of high-pressure and low-pressure gases is connected to the gas space.

Sub 4-8. A tire building apparatus according to claim 6, wherein the pressurized gas supplying device for supplying two kinds of high-pressure and low-pressure gases in the gas pressure acting means comprises a first check valve, a pipe connecting a gas inlet port of the check valve to the gas space and a pipe connecting a gas outlet port of the check valve to the gas path, and the first check valve has a cracking pressure exceeding a pressure of a low-pressure gas but being less than a pressure of a high-pressure gas.

9. A tire building apparatus according to claim 6, wherein the gas pressure acting means comprises a vacuum means and a change-over valve

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switching connection to the vacuum means and connection to the gas space in the pressurized gas supplying device, and the gas space is communicated with the pressurized gas supplying device and the vacuum means through the change-over valve.

10. A tire building apparatus according to claim 6, wherein the gas pressure acting means comprises a first check valve and a second check valve arranged in series, and the second check valve is connected at its gas inlet port to a gas outlet port of the first check valve and at its gas outlet port to a gas inlet port of the first check valve, and the second check valve has a cracking pressure exceeding a vacuum pressure but being less than an atmospheric pressure.

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